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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/686,959	10/12/2000	Toshiki Usui	Q61232	5709

7590 01/27/2004

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2100 Pennsylvania Avenue NW  
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EXAMINER
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TRAN, LY T

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 01/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/686,959

Applicant(s)

USUI, TOSHIKI

Examiner

Ly T TRAN

Art Unit

2853

NW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,4,6-13,25,30-37,49,50,53,55-62,74,77,79-86 and 98-122 is/are pending in the application.
- 4a) Of the above claim(s) 98-112 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,6-13,25,30-37,49,50,53,55-62,74,77,79-86,113,115,117,119 and 121 is/are rejected.
- 7) ☒ Claim(s) 114,116,118,120 and 122 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of species 1, figure 5-11 in Paper No. 11 is acknowledged. Also, new claims 98-112 are disclosed in species 2, not species 1, therefore, claims 98-112 are withdraw from consideration.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4, 6, 25, 30, 35-37, 49, 50, 53, 55, 74, 77, 79, 113, 115, 117, 119, 121 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurosawa (USPN 5,900,888) in view of Ims (USPN 5,136,305) and McBride, Jr et al. (USPN 3,914,862).

With respect to claims 1, 6, 25, 30, 35-37, 49, 50, 53, 55, 74, 77, 79, 113, 115, 117, 119, 121 Kurosawa discloses an ink jet apparatus and a method comprising:

- Ink reservation amount obtaining means for obtaining the ink reservation amount in the in reservoir (Column 8: 39-42)
- Ink consumption amount controlling means for controlling the ink consumption amount of the recording head based ink reservation amount

obtaining by the ink reservation amount obtaining means (Column 10: line 56-67)

- the ink reservation amount obtaining section detects the ink consumption amount and obtains the ink reservation amount in the ink reservoir (Column 8: line 39-42).
- generating a driving signal that makes the recording head perform a recording operation, ink consumption amount controlling means adjust the driving signal for the recording operation, driving pulse for ejecting ink droplets, ink consumption amount controlling means adjusts the driving voltage and pulse form of the driving pulse based on the ink reservation amount (Column 9: line 14-16 discloses print control performed in accordance with the determination result of ink, the print control is a broad term and can be included many thing that relate to printing operation such as driving form, ejection volume ect.)

However, Kurosawa fails to teach temperature change amount obtaining means for obtaining the temperature change amount per unit of time of the head and ink consumption amount controlling means for controlling the ink consumption amount based on temperature change amount per unit of time, temperature information from the temperature detecting means generating a driving signal that makes the recording head perform a recording operation.

Ims teaches measuring the voltage change of the thermistor to determine the amount of ink left in the cartridge, by measuring the voltage change of the thermistor,

the temperature change also be measure, ink reservation amount as a function of the temperature change per unit of time (Fig.4, Column 5: line 32-62), temperature information from the temperature detecting means generating a driving signal that makes the recording head perform a recording operation (Column 5: line 66-68).

McBride shows that the thermistor and the photosensor is an equivalent structure known in the art. Therefore, because these two were are-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute thermistor for photosensor for the same purpose such as to detect the ink in the cartridge.

3. Claims 11-13, 60-62, 84-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurosawa (USPN 5,900,888) in view of Ims (USPN 5,136,305) and McBride, Jr et al. (USPN 3,914,862) as applied to claims 1, 50 and 74 above, further in view of Takahashi (USPN 6,145,949).

The combination of Kurosawa, Ims and McBride fails to teach temperature information from the temperature detecting means generating a driving signal that makes the recording head perform a recording operation, ink consumption amount controlling means adjust the driving signal for the recording operation, driving pulse for ejecting ink droplets, ink consumption amount controlling means adjusts the driving voltage and pulse form of the driving pulse.

Takahashi teaches temperature information from the temperature detecting means generating a driving signal that makes the recording head perform a recording

operation, ink consumption amount controlling means adjust the driving signal for the recording operation, driving pulse for ejecting ink droplets, ink consumption amount controlling means adjusts the driving voltage and pulse form of the driving pulse (Column 6: line 10-26, Fig.4A, 4B).

It would have been obvious to one having ordinary skill in the art at the time the invention was made as modify to control the driving signal, driving pulse fort ejecting ink droplet based on the temperature as taught by Takahashi. The motivation of doing so is obtain a constant density.

4. Claims 7-10, 31-34, 56-59 and 80-83 rejected under 35 U.S.C. 103(a) as being unpatentable over Kurosawa (USPN 5,900,888) in view of Ims (USPN 5,136,305) and McBride, Jr et al. (USPN 3,914,862) as applied to claims 1, 25, 49 and 74 above, further in view of Takayanagi (JP 05-050590) and Murray et al. (USPN 6,290,321).

The combination of Kurosawa, Ims and McBride discloses the claimed invention except for store the recording head temperature information from the time when the power source is turned on, in the waiting state of the recording operation, holds the stored head temperature information even after the power source if turned off and using the head temperature information held in the temperature information storing means when the power source of turned on again within a specified time after the power source if turned off.

Takayanagi teaches to store the temperature information in a non-volatile memory (Abstract).

Murray teaches using the non-volatile memory to retain the data on the cartridge even the power turn off (Column 6: line 38-43)

The combination of Takayanagi and Murray et al teach store the recording head temperature information from the time when the power source is turned on, in the waiting state of the recording operation, holds the stored head temperature information even after the power source if turned off. While Takayanagi and Murray et al does not specifically teach using the head temperature information held in the temperature information storing means when the power source of turned on again within a specified time after the power source if turned off, it provide the teaching of by retaining the information after the power turned off, the information can by use when the power turn on again so eliminating to redetect the head temperature after the power turn on again.

It would have been obvious to one having ordinary skill in the art at the time the invention was made as modify to store the recording head temperature information from the time when the power source is turned on, in the waiting state of the recording operation, holds the stored head temperature information even after the power source if turned off and using the head temperature information held in the temperature information storing means when the power source of turned on again within a specified time after the power source if turned off as taught by Takayanagi and Murray et al. The motivation to doing so is in order to retain the data after the power is turned off.

***Allowable Subject Matter***

5. Claims 114, 116, 118, 120 and 122 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 114, 116, 118, 120 and 122 are allowable over prior art of record because at least prior art have not been found to anticipate or teach ink reservation amount as a function of the temperature change amount per unit of time based on the formular  $T = T_t + k \Delta T$


Wherein  $T$ =ink temp.,  $T_t$ = detected head temp.,  $K$  is an adjustment coefficient and  $\Delta T$  is an temp change amount

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ly T TRAN whose telephone number is 703-308-0752. The examiner can normally be reached on M-F (7:30am-5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on 703-308-4896. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0967.

  
Stephen D. Meier  
Primary Examiner

lt  
Jan. 23, 04